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21 May 1980

Worldwide Report

ENVIRONMENTAL QUALITY

No. 254

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MINING IN GDR, CSSR CAUSES DUST FALLOUT IN SWEDEN

Stockholm DAGENS NYHETER in Swedish 8 Apr 80 p 10

[Text] Sweden is an involuntary importer of dirty air from Czechoslovakia (CSSR) and East Germany (GDR). It involves primarily sulfuric gases and pollutants from power plants burning brown coal. But an environmental expert on sulfur and official in Berlin informs DAGENS NYHETER that the immediate goal is not to increase the sulphur percentage in the air despite increased production of energy.

According to an investigation made in 1974 by OECD the two biggest sources of sulfur pollutants in Sweden are the German Democratic Republic and England with 50,000 tons each. Next come Denmark and West Germany with 30,000 tons each. Czechoslovakia with 8,000 tons is one of lesser ones.

Sweden discharges annually about 300,000 tons of sulfur pollutants. A bare one-third falls on neighboring countries.

The situation is tricky in the German Democratic Republic. Brown coal is the largest source of raw material with calcium salts number two. Both are big polluters. Brown coal is found in the southern part of the republic, south of the line Bitterfeld-Cottbus. Brown coal is half water, so it is not economical to transport it long distances. Hence, the production of energy based on brown coal is concentrated in the coal fields, as well as the industries using the power.

The Halle-Leipzig-Bitterfeld triangle is an extremely badly polluted area.

Nuclear Power Being Expanded

It smells of brown coal throughout the German Democratic Republic, but mainly from Berlin south.

In the north there is less industry, and nuclear power plants are being built along the Baltic coast and near Magdeburg. Four aggregates are in operation, and a fifth will start up this year. According to plans there will be 8 more.

One new coal-burning power plant will be built in the south but that will be all. Thereafter, brown coal-burning power plants will be rebuilt as heating power plants as they reach the age limit.

Water is the biggest problem. The German Democratic Republic is an area with little rain, and there are parts which are pure steppe. The Elbe which starts in Czechoslovakia and flows through the German Democratic Republic into West Germany and the North Sea is the most important water course. Filth from Bohemia in Czechoslovakia flows along with the Elbe. The Oder is the boundary river between the German Democratic Republic and Poland is hardly used for industrial purposes. Then there is the Saale, and that's the end of any water courses of any significance.

Water management in the German Democratic Republic sharply separates industrial water and drinking water in the badly eroded areas in the south. There are long pipe lines with drinking water.

Water Reused

Industry uses three-quarters of all the water in the German Democratic Republic, but in the last 5 years the industrial use of water has been reduced one-fifth. In some industrial areas water is used five times.

Now it's agriculture's turn. At the moment it is too expensive to pump up ground water to irrigate the fields. Ground water in principle may only be used for drinking water.

But the ground water situation is said to be absolutely chaotic in the brown coal areas where the fuel is obtained by open-pit mining. When the supply of brown coal comes to an end, the pits are filled with ashes from the power plants. Then a laborious rehabilitation process starts. It will take decades to restore ground water conditions in the brown coal districts.

"Protection of the environment and raw material supply will more and more be two sides of the same coin in all highly industrialized communities in the eighties," an official in Berlin says. Quoting a colleague in the west, he says, "The oil shaykhs are the best allies of those who protect the environment."

In the German Democratic Republic the protection of the environment comes under the supervision of ministry for Water Supply. This means that the protectors of the environment have gained power.

6893
CSO: 5000

INCREASED AIR POLLUTION EXPECTED

Jakarta HARIAN UMUM AB in Indonesian 27 Mar 80 p 3

[Article: "Air Pollution Will Increase in Indonesia"]

[Excerpt] In view of the growth of large cities in Indonesia at this time, it is estimated that the air pollution level will increase in these cities as a result of greater population density, augmented by added sources of pollution, and a decline in the number of trees and greenbelt areas which function as the cities' lungs.

Air pollution is considered an urgent problem in Indonesia, but signs of increasing pollution are evident in several places, particularly in residential, industrial, and mining areas, according to a 1979 report on environmental quality published by the office of the minister of state for supervision of development and environment.

Heretofore, little data was available on pollution levels in Indonesia. Therefore, the extent of air pollution in various locations in Indonesia was unknown.

According to an air quality survey, dangerous air pollution levels exist in a number of cities as evidenced by "smog" and dust particles coating roofs of homes in and around mining and plant areas, and the heavy fumes on a number of primary roads.

A pollution survey conducted in the Special Capital Region of Jakarta some time ago showed that there was high pollution from carbon monoxide elements and gases emitted by motor vehicles and from dust.

Near the Hotel Indonesia, there was a concentration of 60 ppm [parts pollution per million parts of air], 50 ppm in Salemba (in front of the University of Indonesia), 65 ppm in the Glodok environs, and 60 ppm in the environs of Pangeran Jayakarta Street. A high concentration of dust and carbon monoxide (8.7 mg per cubic meter) was recorded in the Dewi Sartika/Bogor intersection, on the Bekasi Highway (near Iron and Steel, it was 8.26 mg per cubic meter). It was 6.8 mg per cubic meter in Tanah Tinggi Poncol.

A survey conducted by the Medical Faculty of Diponegoro University in Semarang showed a particulate concentration of particles of 30 mg per cubic meter and a carbon monoxide concentration averaging up to 100 ppm in various parts of the first class city of Semarang. In some areas, the carbon monoxide concentration reached 200 ppm as on the Gombel slopes, and a high particulate concentration was also recorded in Kudus.

6804
CSO: 5000

BRIEFS

PESTICIDE BAN--The minister of agriculture through his decision No 59/Kpts/Um/j/1980 has banned the use of pesticides containing pentachlorophenol and sodium salts for wood preservation and for other uses. The ban is based on the consideration that pesticides containing active pentachlorophenol or sodium salts used for wood preservation in particular have undesirable side effects for humans especially workers, and on the environment in general. This decision took effect on 26 January, and, therefore, registrations and licenses which have been granted for the use of pesticides containing these substances since that date are revoked. Pesticides containing these substances, imported after this date under licences issued by the Department of Trade and Cooperatives, may be used as wood preservatives only if the user is granted a license by the minister of agriculture or other designated officials. Further, he must strickly abide by all safety requirements for its use. Pesticides entering the Republic of Indonesia without licenses from the Deparment of Trade and Cooperatives must be shipped out of Indonesia by the importer. If the pesticides are not shipped out, the importer--that is, the distributor or the warehouser--is obligated to destroy these pesticides at his own expense with the concurrence of the pesticide director or controller of the province concerned. Plant petsticides for distribution or sale in Indonesia must be approved by the Pesticide Commission comprised of officials of various departments. This commission is responsible for selecting for distribution pesticides for controling plant pests and diseases that will not distrub the environment or endanger humans, cattle and other livestock. [Excerpts] [Jakarta KOMPAS in Indonesian 25 Mar 80 p 2] 6804

BANDUNG RIVER POLLUTION--According to a microbiological study, all river networks in Bandung are badly polluted by domestic garbage and industrial wastes. An environmental quality study of the first class city of Bandung concluded that the Cikakak, Citepus, and Cironyom river networks are the most polluted from a sanitation and microbiological standpoint. Team chairman Dr R.T.M. Sutamibardja of the Center for the Study of Management of Power Resources and Environment of the Bogor Agricultural Institute (PUSDI PSL-IPB) gave this information to KOMPAS on Tuesday afternoon [25 March]. Sutamihardja said the study was based on analyses of the quality of the Bandung river waters including those of the Cikapundung, Ciguriang, Leuwilimus--the Cipedes, Citepus, Cikakak--Ciroyom, Cikapayang, and Cikapundung rivers which are used for a variety of purposes. He added that the Bundung river networks are not polluted by chlorine but phenol has polluted all rivers but those in the Cikapundung network. Therefore, they cannot be used for all purposes. Compared with the standard silica content, Bandung river waters can still be used by the textile industry and to provide steam for electric power purposes. Compared with the standard iron content, they are not suitable for drinking purposes or fishing and cattle raising. Bandung rivers are polluted to a medium or serious extent by organisms according to phyto, zooplankton and Benthos tests. [Excerpts] [Jakarta KOMPAS in Indonesian 27 March 80 p 6] 6804

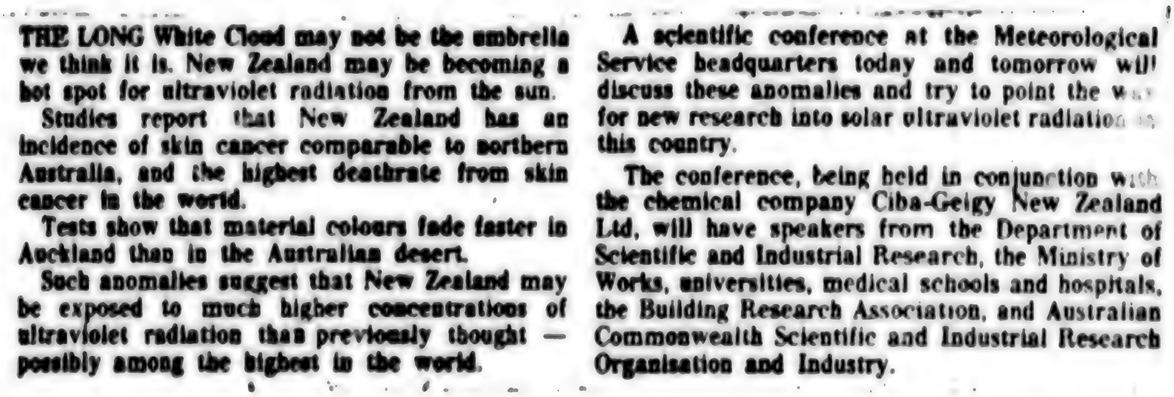
CSO: 5000

NEW ZEALAND

NATION'S SOLAR ULTRAVIOLET RADIATION FOUND VERY HIGH

Wellington THE EVENING POST in English 26 Mar 80 p 4

[Text]



THE LONG White Cloud may not be the umbrella we think it is. New Zealand may be becoming a hot spot for ultraviolet radiation from the sun.

Studies report that New Zealand has an incidence of skin cancer comparable to northern Australia, and the highest deathrate from skin cancer in the world.

Tests show that material colours fade faster in Auckland than in the Australian desert.

Such anomalies suggest that New Zealand may be exposed to much higher concentrations of ultraviolet radiation than previously thought — possibly among the highest in the world.

A scientific conference at the Meteorological Service headquarters today and tomorrow will discuss these anomalies and try to point the way for new research into solar ultraviolet radiation in this country.

The conference, being held in conjunction with the chemical company Ciba-Geigy New Zealand Ltd, will have speakers from the Department of Scientific and Industrial Research, the Ministry of Works, universities, medical schools and hospitals, the Building Research Association, and Australian Commonwealth Scientific and Industrial Research Organisation and Industry.

CSO: 5000

PEOPLE'S REPUBLIC OF CHINA

EAST CHINA SEA COASTAL POLLUTION INVESTIGATED

Shanghai WEN HUI BAO in Chinese 17 Apr 80 p 1

[Article by Ge Jianya [5514 1696 0068] "China Completes First Investigation of Coastal Pollution of East China Sea; Coordinated Effort by Pertinent Units From Jiangsu, Shanghai, Zhejiang, Fujian, and the State Oceanographic Bureau"]

> [Text] One hundred ten thousand square kilometers of coastal waters surveyed; more than 10,000 water samples and organisms collected, as well as hundreds of thousands of pieces of data of various kinds to provide a scientific basis for doing a good job in environmental protection work in the East China Sea.

Our country has triumphantly completed its first large scale pollution survey of coastal waters in the East China Sea. As a result of the survey, preliminary understanding has been gained about the environmental situation in the East China Sea to provide scientific environmental protection data about the East China Sea.

The East China Sea is our country's main eastern entrance. The sea is vast, its resources abundant, the coastal waters contain numerous important cities, harbors and production bases for industry, agriculture, and the fishing industry, and within the coastal waters lie the famous Zhoushan and Lusi fishing areas. Along with the development of production enterprises has come a constant increase in the quantity of the "three wastes" (waste gas, waste water, and industrial residue). In order to clarify the situation regarding pollution of the East China Sea, relevant units convened a Joint East China Sea Pollution Investigation and Monitoring Conference in January 1979. The Jiangsu, Shanghai, Zhejiang, and Fujian environmental protection departments and the East China Sea Branch, and the Second and Third Oceanographic Institutes of the State Oceanographic Bureau established a joint East China Sea Investigation and Monitoring Unit, and drafted a unified investigation program. Later on each cooperating unit worked together on a series of preparatory tasks for the investigation of coastal pollution in the East China Sea.

Between 1978 and 1979, they conducted investigations during abundant water periods, dry periods, and periods of normal water, with a total of more than 150 units and more than 800 people participating. In a spirit of unity and cooperation and acting on a unified plan, unified distribution of monitoring stations, unified investigation and inspection methods, unified timing, and unified methods of processing data, they strictly implemented an investigation program. Undaunted by either the intense heat of summer or the severe cold of winter, the oceanographic investigation personnel put to sea many times in the face of the wind and against the waves, with leading cadres plunging into the front line to take command to carry out investigation and take samples from investigation ships over a 115,000 square kilometer expanse of sea. Environmental protection and health technicians from the provinces and cities concerned overcame all sorts of difficulties to penetrate into water systems of all kinds and into harbors and the mouths of rivers to conduct investigations, and to diligently perform laboratory tests and analyses on the samples collected. Under the close coordination and mutual support of all units, a multi-faceted comprehensive investigation covering 1,369 station times was conducted from Haizhouwan in Jiangsu to Loyuanwan in Fujian (most of the East China Sea and part of the southern Yellow Sea), as well as of coastal water systems, and harbors and river mouths. This investigation collected a total of more than 10,000 water samples and samples of organisms, and obtained several tens of thousands of pieces of data of various kinds. Additionally, it also collected hydrographic, meteorological, and geological data. Most of the large quantity of precious data collected was diligently examined and verified, analyzed and catalogued by numerous teachers, scientists, and technicians. As a result of this large scale investigation, preliminary understanding has been gained of the environmental situation in the East China Sea, which will be helpful in the adoption of measures for and strengthening control over the "three wastes," and for further perfecting environmental monitoring work so as to do an effective job in environmental protection in coastal areas of the East China Sea.

9432
CSO: 5000

BRIEFS

ECOLOGY AWARD--Ecologists Professor Vlastimil Vanicek of Czechoslovakia and Franz Weber of Switzerland share the 1981 European Award for Protection of Life Environment awarded by the Weber Foundation of Montreux, Switzerland. [Prague LIDOVA DEMOKRACIE in Czech 25 Apr 80 p 2]

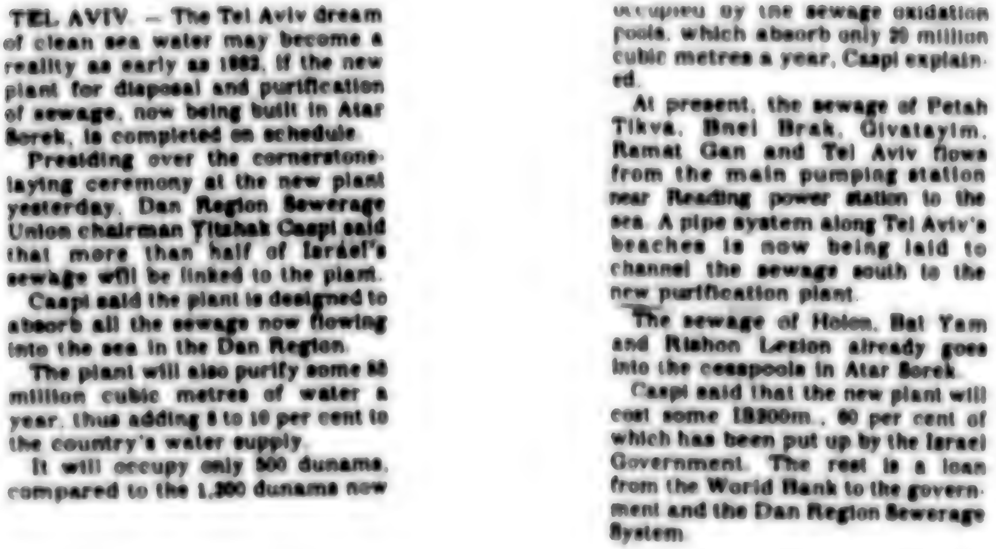
CSO: 5000

SEWAGE PLANT UNDERWAY IN DAN REGION

Jerusalem JERUSALEM POST in English 29 Apr 80 p 3

[Article by Michal Yudelman]

[Text]



TEL AVIV. — The Tel Aviv dream of clean sea water may become a reality as early as 1982, if the new plant for disposal and purification of sewage, now being built in Atar Sorek, is completed on schedule.

Presiding over the cornerstone-laying ceremony at the new plant yesterday, Dan Region Sewerage Union chairman Yitzhak Caspi said that more than half of Israel's sewage will be linked to the plant.

Caspi said the plant is designed to absorb all the sewage now flowing into the sea in the Dan Region.

The plant will also purify some 85 million cubic metres of water a year, thus adding 8 to 10 per cent to the country's water supply.

It will occupy only 500 dunams, compared to the 1,300 dunams now occupied by the sewage oxidation pools, which absorb only 20 million cubic metres a year, Caspi explained.

At present, the sewage of Petah Tikva, Bnei Brak, Givatayim, Ramat Gan and Tel Aviv flows from the main pumping station near Reading power station to the sea. A pipe system along Tel Aviv's beaches is now being laid to channel the sewage south to the new purification plant.

The sewage of Holon, Bat Yam and Rishon Lezion already goes into the cesspools in Atar Sorek.

Caspi said that the new plant will cost some IL300m., 60 per cent of which has been put up by the Israel Government. The rest is a loan from the World Bank to the government and the Dan Region Sewerage System.

CSO: 5000

WATER SUPPLY SHORTAGES AFFECT SANITATION, ENVIRONMENT

Maputo NOTICIAS in Portuguese 6 May 80 p 3

[Text] The problem of water shortages in various buildings raises serious social and sanitary, and even economic, questions. For a city like Maputo, only recently "mozambicanized," where a long-range program for the education of the urban population regarding sanitation, hygiene and conservation of buildings must be developed, the lack of a regular supply of running water brings about the further deterioration of our already low level of sanitation in our city, besides seriously affecting such a program. There are hundreds of cases of truly vexatious and indeed dramatic situations of buildings with 5, 10 or more floors in which the water pumps used to bring water to the upper floors are damaged. These constitute a serious threat to public health: toilets, clothes, kitchens and other facilities in constant need of water cannot be supplied through bottles, cans and pots painfully carried up from the first floor. On the contrary, after repeatedly going [illegible] and down the stairs carrying water containers on their heads, building dwellers become tired and resort to extreme conservation measures in order to avoid the stairs as much as possible.

As a result, houses are dirty, children are not washed and favorable conditions are created for the outbreak of infectious diseases, indeed for epidemics that can affect first the building, then the entire area and so forth, despite the efforts of our sanitation services.

Furthermore, the buildings themselves deteriorate greatly; stairs and walls are splashed with often dirty water from the containers. If the elevator is used, it is transformed into a quagmire where children like to play, besides the fact that they are made to carry undue loads, a reason for frequent malfunctions.

Can it be that the APIE [Administration of State Lands and Property] and the companies that supply spare parts for water pumps are not aware of this situation?

CSO: 5000

MOSCOW CONDUCTS AIR POLLUTION MONITORING EXPERIMENT

Moscow PRAVDA in Russian 16 Jan 80 p 6

[Article by V. Chebakov: "What the City is Breathing"]

[Text] "You're lucky," said V. Chirkov just before we took off. "Few are graced with the chance of admiring the capital for a few hours from a bird's eye view, and for that matter on such a clear day."

We took off from a Moscow suburban airfield on a frosty morning. In just a few minutes Yu. Asaturov, the craft commander, piloted the IL-14 to its operating course. The route was extremely simple--it followed the Moscow ring road. Our flight was being conducted as part of the program of integrated research on Moscow's air basin. To put it more simply, our job was to find "dirty" air above the capital and the sources from which it was entering the atmosphere.

Tables bearing electronic instruments, recorders, gas counters, and containers joined together by a maze of tubing were on the right and left of the aircraft's body. It was a little crowded, but we could not move any of the apparatus into "another room." The laboratory operators--colleagues of the Institute of Applied Geophysics--prepared the instruments for work. Expedition chief Vladimir Pavlovich Chirkov explained the tasks briefly.

Next to me, meteorologist Aleksandr Krasa and mechanic Igor' Bol'shakov unpacked the filters--white rings made from a special cloth. These were carefully transferred into cassettes, three in each. Later samples of air from outside the airplane would be passed through them. After being processed on the ground, the white circles would tell us about the concentration of toxic wastes, and their sources.

"Our task," said expedition chief V. Chirkov, "is to determine the 'vertical cross-section' of Moscow's air basin, and find the areas in which it is contaminated by sulfur dioxide, nitric oxides, and sulfates. The instruments will help us measure their concentrations in the atmosphere at different altitudes, and to determine the quality of wastes discharged by individual enterprises."

As we approached the Moscow Petroleum Refinery, the instrument recording presence of sulfur dioxide responded with a jagged mark on its recording tape. Geophysicist Boris Abramovskiy immediately made a pencil notation and noted the time. Another mark--another note.

"Is this stack throwing out a lot of stuff?" I asked. "Look how much it's smoking...."

"It's within normal, practically harmless to the city," Abramovskiy answered. "Our instruments are very sensitive, and they can react even to microconcentrations of various substances. This is why the recorder responded in this way. The instrument readings of today's flight as well as of previous ones confirmed a known fact: The air above the Soviet capital is healthy and clean."

This is the first time the Integrated Moscow Experiment (KME) is being conducted. It is intended to last 2 years. Scientists and workers in motor transportation, civil aviation, and the hydrometeorological service are taking part in it. Their actions are being coordinated by a staff created in the USSR State Committee for Hydrometeorology and Environmental Control. The main goal of the experiment is to develop recommendations on reducing discharges, and to improve the sanitary-hygienic condition of the capital air basin.

Dozens of ground stations are cooperating in the experimental program today; they are sampling air and soil to determine the concentrations of harmful impurities and dust. Recently the ANKOS system, which monitors the condition of the water basin of the Moskva River, went into operation. In addition to the flying laboratory, research is being conducted on vertical distribution of impurities contaminating the air by instruments installed at the Ostankinskiy High-Altitude Complex and atop the hydrometeorological tower in Obninsk.

The Kashir highway, Warsaw highway, Bittsa, Tushino, Khimki. From an altitude of 300 meters it is easy to orient oneself in relation to the architectural pattern of the new regions, and the delicate pattern of road interchanges. We were in our fourth hour of flight. I attentively monitored the "behavior" of the recorders as we approached the Olympic facilities. After all, one of the other tasks of the experiment is to develop recommendations on reducing air pollution facilities for the 22d Olympics.

"Data acquired during the experiment," said I. V. Tsvetkov, deputy chief of the State Committee for Hydrometeorology and Environmental Control administration, before the flight, "will allow us to account for the plants, factories, highways, parking lots, and other sources of pollution directly contiguous with the Olympic stadiums and tracks. Our specialists will suggest the best places for parking lots depending on summer winds. There are plans for creating atmospheric pollution control stations right at the

Olympic facilities, so that the capital's clean air would help the participants of the Olympic Games attain high results."

We made our last circle above the highway. Once again the instruments showed that the air was clean today.

11004
CSO: 5000

AIR POLLUTION SPECIALIST ON DRAFT CONSERVATION LAWS

Moscow IZVESTIYA in Russian 2 Feb 80 p 2

[Article by V. Gur'yev, Chief Atmospheric Protection Specialist, VNIPMchermetenergoochistka: "Green Light for the Discoveries"]

[Text] Ferrous metallurgy was one of the first sectors of the national economy that came to recognize its not infrequent harmful influence upon the surrounding environment. Presently it accounts for 15 to 25 percent of various substances contaminating the air of major industrial cities. Twelve years ago the All-Union Scientific Research and Planning Institute of By-product Gas and Sewage Treatment and Utilization of Secondary Power Resources by Ferrous Metallurgy Enterprises--VNIPMchermetenergoochistka--was established in Khar'kov. Its colleagues, as is probably true with other sector institutes of this profile, felt the need for a law on protection of the atmosphere most keenly. After all, it is no secret that not all industrial executives and common laborers have come to fully recognize, with high responsibility, the need for introducing resources into production for protecting the environment from pollution.

Within its relatively short life thus far, our institute has furnished technical solutions to problems faced by ferrous metallurgy associated with removing dust, sulfuric anhydride, fluoride compounds, and acid vapors from industrial wastes. The task today is to accelerate implementation of these solutions in production. Methods and apparatus are being developed for removing major contaminants such as carbon monoxide, nitric acids, and others from gases. These developments will be completed by as early as the 10th Five-Year Plan. Extensive introduction of systems for removing all forms of contaminants from gases in the 11th Five-Year Plan will make it possible to significantly improve the atmosphere of cities possessing metallurgical industry.

I would like to emphasize that atmospheric protection has both a social and an economic impact. As an example just introduction of our institute's developments alone will produce a savings of about 4 rubles for every ruble spent.

Having reviewed the draft "Law of the Union of Soviet Socialist Republics on Protection of Atmospheric Air" and having noted its urgency, I feel it necessary to make my own suggestions, and to refine the wording of some of its articles. Thus Article 7, which requires the planning of measures to protect the air with a consideration for short-term and long-range forecasts of its condition, must be supplemented by the following: "...on the basis of short-term and long-range forecasts of the development of all industrial sectors, to include power engineering and all forms of transportation, within the region or industrial complex as a whole." The need for such an amendment is elicited by the fact that we would be able to draw up a forecast of atmospheric protection only after writing up a forecast for development of the entire industrial region.

In my opinion the following thought should be added to Article 11: "...reduce the time permitted for the review of claims for discoveries and inventions associated with environmental protection and with creation of low-waste and wasteless production processes."

11004
CSO: 5000

INDUSTRIAL WATER POLLUTION IN LATVIA

Riga SOVETSKAYA LATVIYA in Russian 6 Feb 80 p 2

[Article by A. Osipov, Senior Inspector, Republic Inspection Office for the Protection of the Waters of the Baltic Sea: "Finishing What Was Started"]

[Text] Considering the swift growth of industrial production, conservation of aquatic resources has become one of the most important state tasks. This is why the CPSU Central Committee and the USSR Council of Ministers have adopted a number of decisions in recent years aimed at improving conservation of aquatic resources and their sensible use.

Satisfying these party and government directives, last year enterprises subordinated to the Latvian SSR Production Association of Fish Industry (Latrybprom) and the Latvian SSR Union of Fishing Kolkhozes did a great deal of work to conserve and sensibly use aquatic resources. Thus introduction of recycling systems at the Liyepaya Fish Canning Plant made it possible to reduce consumption of drinking water for production needs by 100 cubic meters per day, as a result of which the annual discharge of contaminated liquid wastes decreased by 49,000 cubic meters. Fat separators that can extract 11,250 kilograms of technical grade fat from liquid wastes were introduced at the plant. Owing to introduction of recycling systems and fat separators the plant has managed to relieve its treatment facilities of their excessive load and make liquid waste treatment effective. Introduction of these measures has permitted the enterprise to save 9,000 rubles. Technical grade fat from liquid wastes is an outstanding raw material for soapmaking industry.

Additional filters were installed at local treatment plants of the Liyepaya base of the ocean-going fishing fleet, which made it possible to dramatically raise the effectiveness of liquid waste treatment and bring it up to standard. Before, 1 liter of liquid wastes from the repair complex contained up to 20-25 milligrams of petroleum products, while after installation of a petroleum filter, such products no longer contaminate liquid wastes.

A number of innovations were introduced into the fish processing shop of the Pavilosta division of Bol'shevik Kolkhoz. Thus the installed smallcontainer fish canning line did not require an increase in water consumption, and washing of empty containers at high temperature excluded use of alkaline solution from the production process. Implementation of these and other measures made it possible to conserve 7 cubic meters of water each day (or 2,550 cubic meters per year), which is 35 percent of its total consumption in the shop. All vessels of the Bol'shevik Fishing Kolkhoz have now been fully outfitted with tanks for collection of petroleum-contaminated water, and contaminated water handling systems. Last year the vessels were outfitted with fecal waste collection tanks significantly ahead of schedule.

Floating barriers 100 linear meters long were set out in the water basin to prevent the spread of petroleum products and trash, and double the deployed number are constantly ready for the event of an oil spill by towed vessels. A number of organizational measures have been implemented at the harbor to prevent pollution of the water basin.

All of this has made it possible to significantly reduce pollution of the fishing port's water basin by petroleum products and trash. But despite the work that has been done, there are still many shortcomings in conservation of water and its sensible use. Thus last year the Latrybprom's specialized construction and installation administration was unable to complete construction of local treatment plants at the Liyepaya Fish Canning Plant: Only 100,000 rubles of the 150,000 planned were assimilated. Latrybprom was unable to supply the base with special vehicles to transport fecal wastes from the vessels to urban treatment plants. The vessels have not been fully supplied with series-produced trash receptacles.

Latrybprom has been unable to fulfill the base's orders, from one year to the next, for resources by which to collect petroleum-contaminated water, fecal wastes, and trash from the vessels. The existing resources are worn out, and for this reason they require replacement. Articles have been written about this in the press several times, but no progress is being made.

A great deal of water conservation measures are to be implemented in 1980. The Liyepaya Fish Canning Plant must finish construction of local treatment plants, the Bol'shevik Fishing Kolkhoz must reconstruct its sewage network and connect it to the urban treatment plants, the base of the ocean-going fishing fleet must outfit its vessels with resources to prevent the sea's contamination, and Construction and Administration No 426 must build a sewage main leading to urban treatment plants.

The Capital Construction Department of the Liyepaya City Executive Committee must install a sewage main and connect to it the sewage networks of the Bol'shevik Fishing Kolkhoz, the fish canning plant, and the base of the ocean-going fishing fleet. This important work must be started right now, at the start of the year, without delay.

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DEVELOPMENT OF BAKU'S SEWAGE SYSTEM

Moscow ZHILISHCHNOYE STROITEL'STVO in Russian No 2, Feb 80 pp 16-17

[Article by engineers I. B. Topor (Baku) and L. S. Gol'dman (Moscow)]

[Text] Sewage disposal is the most important sector of modern urban administration; without it, it would be impossible to maintain the city's sanitary-hygienic condition, protect the environment, and create conditions for further development of housing, cultural and personal, and industrial construction.

Baku's sewage system is an elaborate engineering complex consisting of an urban sewage system and external networks and domestic sewage treatment facilities. The total estimated cost of the complex's construction is 108 million rubles.

Inventor collectives of the leading planning institutes have made a major contribution to creation of a flexible, efficient, and economical scheme of storm drainage and domestic waste treatment in Baku: The TSNIIEP [Central Scientific Research Institute of Experimental Planning] of Engineering Equipment, the Soyuzvodokanalproyekt [not further identified], the Tula and Stavropol' branches of the Promstroyproyekt [State Planning Institute for General Construction and Sanitary-Engineering Planning of Industrial Enterprises], the Baku State Institute for City Planning, the Baku Branch of Soyuzvodokanalproyekt, the All-Union Scientific Research Institute of Water Supply, Sewer Systems, Hydraulic Engineering Structures, and Engineering Hydrogeology, the Azerbaijan SSR branch of the All-Union State Planning, Surveying, and Scientific Research Institute of Power Systems and Electric Power Networks, the Bakgidroproyekt [not further identified], the State Institute for Planning in River Transportation, the Kaspmorniiproyekt [not further identified], and other scientific research and planning organizations.

The purpose of the urban sewage system is to collect domestic wastes from all of the city's basins and carry them to the external networks transporting water to all-city treatment plants located in the vicinity of the settlement of Gousany.

By the year 2000, the estimated quantity of domestic liquid wastes will be 1.3 million m^3 per day (the capacity of the first-generation facilities is 800,000 m^3 per day). Inventor collectives of the TSNIIEP of Engineering Equipment and the Tula Promstroyproyekt resolved the complex problem of outfitting the city with sewage facilities by building four city sewage mains serviced by a single pumping station. In this case more than half of the city's total volume of liquid wastes are drained into external networks and then to the treatment plants by gravity flow. The rest of the liquid wastes are pumped by two pumping stations servicing the external networks.

Development of industry and construction of housing and of cultural and personal facilities in Baku have resulted in a certain disproportion in the removal of domestic wastes, as a result of which the throughput of the existing sewage network has become inadequate.

The existing water treatment facilities at Zykh, which subject liquid wastes to mechanical treatment, are unable to treat the domestic wastes of a city of million and a half. To resolve the problem of placing the complex of treatment facilities outside the city limits, engineers have to make maximum use of the existing sewage lines.

It was relatively easy to solve the problem of removing liquid wastes from the city's center and southwest. Sewage and storm drain networks that carry discharge to the lower part of the city were connected to the existing sewer main which had previously been laid in unfilled trenches; then sewage was moved by a pumping station through delivery lines to the Zykh treatment facilities.

The sewage and storm drain networks leading from the upper part of the city, which had a reserve of unused capacity, were fully able to serve their purpose up to a particular point in time, while the sewer main, which was laid at a low angle and thus carried liquid wastes at a slow rate, was soon unable to service these networks to full capacity.

For a number of reasons it turned out to be impossible to lay a second exposed main, and so new technical concepts satisfying the requirements of the local conditions had to be sought with a consideration for the use of progressive methods in utility line construction.

The concept that was adopted following examination of numerous variants was construction of the underground seaside sewage main along the embankment of Baku Bay.

The underground seaside sewage main is the principal collecting main for the city's lower zone. It services the western part of Baku Bay, Cape Bailov, the coastal Shikhovskaya vacation resort zone, and urban buildup in the city center. This main will also receive discharge from the upper parts of the existing Okruzhnyy and Samotechnyy sewer mains and the

Gamlygel' residential district, in which construction of a new microdistrict will soon begin. The length of the seaside sewer main is 9.6 km, the gate diameter is 2.6 meters, and its capacity is 280,000 m^3/day. The main passes near the shoreline below the level of the Caspian Sea, crosses the boulevard, the Baku marine port , and Rabochii Prospect, and it carries liquid wastes to Pumping Station No 2 servicing external networks and facilities located on the territory of the existing Zykh treatment facilities.

Completion of the seaside main's construction will make it possible to halt discharge of liquid wastes into the bay along the entire boulevard, and this means that the favorite recreation area of Baku's residents--the boulevard, one of the city's most beautiful places--will be rehabilitated.

The second most important sewage main within the urban sewage system is the industrial zone main, which will be able to handle about 500,000 m^3 of liquid wastes per day. The length of its route is 10 km, and the diameters of the reinforced concrete pipes are from 1,500 to 2,500 mm.

This main drains the city's northwestern residential district, structures in the presently developing settlement of Khurdalan, the existing Vostochno-Montinskiy sewer main, and the industrial district. The planners have already successfully completed the task of laying the main's route, making sensible use of the local terrain. Presence of a piezometric difference in the water levels permitted the engineers to plan a sewer main operating under gravity-flow conditions without pumping stations. Liquid wastes pass along the industrial zone sewer through a receiver into the main gravity-flow sewer, and then on to the all-city treatment facilities.

A combined open-air and tunneling method was used to erect the industrial zone sewer main; this made it possible to carry on construction without halting motor and rail traffic, and to cross petroleum and gas pipeline routes without interrupting the production processes of the petroleum refineries. The marshes were surmounted by tunneling combined with erection of a manmade embankment, and concurrent lowering of the water table.

Sections of the sewer main are being laid in the open by construction organizations subordinated to the Glavbakstroy [not further identified], while tunneling operations are being performed by the republic's Ministry of Industrial Construction. The principal sewer main along Arsen Amiryan Street, 5.1 km long, is to reduce the load upon the existing sewage network in the entire northwestern part of the city, which contains a large number of microdistricts, and it is to receive additional discharge from the new residential and industrial regions, to include the quickly developing Apsheronskiy Rayon of Baku.

Collection and removal of liquid wastes within the limits of urban buildup is only part of the task at hand. Another no less complex problem is that of carrying the liquid wastes beyond the city, treating them, and dumping them in the sea. This is why special attention is being devoted to construction of external domestic sewage networks and treatment plants in Baku.

This sewage treatment complex is to include pumping stations No 1 and No 2 with a total productivity of 480,000 m^3/day, and they are to receive liquid wastes from the city sewer mains.

It should be noted that Pumping Station No 2, the underground portion of which is 30 meters deep, is a complex hydraulic engineering structure (the diameter of the underground part is 30 meters); it is being built by a collective of the specialized Volgogradgidromekhanizatsiya [not further identified] administration.

Other structures within this complex are:

The main gravity-flow sewer, consisting of delivery pipelines, a tunnel (with a gate diameter of 4 meters), and a delivery main with an emergency outlet;

treatment facilities providing for mechanical and biological treatment of liquid wastes. The treatment facility area also contains a production base intended for operation of the urban sewage system.

All of these objects are presently under construction. Moreover there are plans for installing a discharge main with a diameter of 3.5 meters and a length of 14 km; it is to terminate at a deep-water outlet extending up to 3 km into the sea. The important task facing the collectives of the construction and planning organizations, the client's service, and Azerkomplekt [not further identified] requires high organization, efficiency, and coordination in the work of all levels. After construction of the sewage system is completed and these facilities are placed into operation, the conditions for rehabilitating the environment and protecting the Caspian Sea from pollution will be created.

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WAYS SOUGHT TO STIFFEN INDUSTRIAL POLLUTION CONTROL

Moscow SOVETSKAYA ROSSIYA in Russian 29 Feb 80 p 2

[Article by V. Yurayskiy, First Deputy Chairman, Kemerovskaya Oblast Soviet of Peoples Deputies Executive Committee, and Deputy to the RSFSR Supreme Soviet: "A Tax on Smoke"]

[Text] I do not think that anyone needs to be persuaded that the air in Kemerovo or Novokuznetsk is not distinguished by cleanliness. The Kuznetsk Basin is known as a land of coal, metal, and chemistry--this in itself says a great deal. Smoke streaming out of huge stacks is, alas, a typical detail of the Kuznetsk Basin panorama. The territorial-industrial complex began evolving in the First Five-Year Plan and in the war years, when extremely little significance was attached to environmental conservation. Moreover, even later the conservation standards were not sufficiently stiff. It is for this reason, for example, that all treatment facilities at many plants are ineffective, and why there are no treatment facilities at all at some others. Take as an example the Kuznetsk Metallurgical Combine. Gas treatment facilities at the combine service only 142 out of 711 sources of air pollution. The same situation can be found at the Belovo Zinc Plant and some other enterprises. This alone is quite enough to explain why the problems of nature conservation in general and of protection of the air environment in particular are acquiring special acuity in the Kuznetsk Basin.

Concern for the environment is a matter of state importance, which has been confirmed once again by publication of the draft Law on Atmospheric Protection. The problems of nature protection are being examined by party committees and local soviets. Oblasts and city staffs are coordinating all of the work, which has truly become massive. Scientists from the oblast's institutions of higher education and scientific research institutes, designers, planners, and medical workers are participating in it. There is a laboratory of environmental protection under the Kuznetsk Basin Polytechnical Institute. Deputy posts and public action groups have been created at the industrial enterprises. Implementation of nature conservation measures is one of the principal indicators of the competitions between cities and rayons.

An entire complex of measures having the purpose of making the air of cities in the Kuznetsk Basin clean is foreseen by a special decree of the USSR Council of Ministers. A large part of these measures have already been implemented. New gas trapping facilities have been put into operation, and a number of enterprises are now using natural gas. Without belaboring the point, let me make this one comparison: Industrial production is continuing its growth in Kemerovskaya Oblast, but the level of air pollution has started to decline.

But why are we still unable to make the air entirely clean, despite the massive efforts? I think because, in particular, we are not approaching the pollution problem itself correctly.

Today, many monitoring organizations--inspection offices, epidemiological stations, and local soviet executive committees--are watching to see that the maximum permissible concentration of toxic substances is not exceeded. Whenever a plant crosses the "red line" by even the smallest amount, it must pay a fine. But if it does not exceed the permissible concentration, remaining a hundredth of a percent below the limit, it can go on spewing out smoke, dust, and gas for years on end. Thus the existing system of fines does not help much since, to repeat, they are paid only after the harm--sometimes irreversible--has already been done. But what specifically is the maximal permissible value? It is an arbitrarily established limit of pollution beyond which there is no return. But should we wait until a plant goes beyond the point of no return? Essentially speaking, a good production operation should not be discharging any wastes. It would probably make sense to change the penalty system itself, and to introduce mandatory payment for all pollution, even insignificant pollution--a unique "tax on smoke."

It appears to me that such a stiff measure would encourage enterprise and department executives to take a much more serious attitude toward waste treatment, accelerate reconstruction of the production operations, and introduce wasteless processes. In reality, however, we find that some plants have still not even developed the technical concept of waste decontamination, and in some places the research is proceeding without rhyme or reason. Take as an example the Kemerovo Azot and Khimprom associations, which discharge gases produced in saltpeter production into the atmosphere following minimal treatment. This causes double harm: pollution of the air and a loss to the state--after all, the gases could be returned to production. But the effort at solving the problem of their utilization is poor. As an example the sector scientific institutions are doing almost no work on this problem at all. In the entire Kuznetsk Basin, even the trapped gases are only 40 percent utilized.

Monies collected by the "smoke tax" could be transferred entirely to the executive committees of the local soviets--the real managers of the city or oblast--for the construction of new treatment facilities. Why, specifically, should we finance nature conservation measures with assets from the budget, which is often the practice today? Another way would be more just: Let those who pollute do the paying.

It is no news to anyone that complaints are being levied at builders everywhere for delaying the commissioning of treatment facilities. The Kuznetsk Basin is no exception. Although the annual volume of construction of gas and dust removing resources has increased by a factor of 1.5 in the last 5 years, the plan is being completed by only 60-70 percent as a rule, and operation of the facilities is often postponed. Is it really so rare to see a new shop already in production but without adequate treatment resources? Why does this happen so often? Is it only due to an unprincipled attitude on the part of the acceptance commission, as is commonly believed?

Here is a typical example: Recently an ammonium production facility was put into operation at the Kemerovo Azot Association. At first, the technical and economic specifications foresaw a closed, wasteless production cycle--no waste, liquid or otherwise. Naturally the executive committee and the inspection organizations readily gave their consent to this. But as always, various alterations had to be made during the planning. But according to the existing statutes these alterations may not be coordinated with the local soviets. And now the closed cycle is no more.

It seems to me that this order must be changed, that executive committee workers must be afforded a possibility for monitoring not only compliance with the technical and economic specifications but also all of the other stages of planning and construction, to include preparation of the blueprints and planning of the pilot complexes. The latter is especially important. Were we to introduce such a rule, where a pilot complex cannot go into operation without a go-ahead from the executive committee, the treatment facilities will finally stop dropping to second and sometimes even third priority of construction.

Incidentally the Kemerovskaya Oblast Soviet of Peoples Deputies has already introduced such an order for local construction projects. But the situation continues to remain as before at the large union and republic facilities.

Naturally not only administrative but also economic control would be important here. It is not difficult to establish such control. It would be enough for the Stroybank to not accept new industrial facilities as completed if the treatment facilities are not finished, and to impose the appropriate material sanctions.

It is commonly accepted that industrial enterprises are the main and sole polluters of the atmosphere. Would that this were so! In Kemerovo, for example, a very high percentage of pollution is caused by motor transportation. And the motor vehicle enterprises are the worst at implementing protection measures. Many motor pools do not possess engine diagnosis stations or posts, and vehicles leave with poorly adjusted fuel and power systems. Even enterprises of the RSFSR Ministry of Motor Transportation have almost no gas analyzers at all. And those that are present do not work at temperatures below -5°. Consider that in light of the fact that in Siberia, winter lasts 6 or 7 months, and temperatures climb above -5° for only 140-150 days of the year. Moreover industry is not producing any gas analyzers for diesel vehicles, which make up two thirds of the entire pool of just the motor vehicle enterprises of the USSR Ministry of Heavy and Transport Machine Building alone.

We must furthermore consider private motor vehicles, the number of which is growing from one year to the next.

If control is to be truly effective, from my point of view we must also make a change in the following: Today, organs of the Hydrometeorological Service are responsible for monitoring the overall condition of the air basin. These organs are constantly being reinforced. Thus in Kemerovskaya Oblast the number of observation posts has been increased, and construction of a zonal meteorological observatory is being started this year in Novokuznetsk. There are plans for creating an oblast observatory and a center for studying and monitoring the natural environment. The prospects would seem to be hopeful. But a state regional inspection office monitoring the work of gas treatment and dust catching facilities also exists in parallel, and its activities could hardly satisfy us. The inspection office is subordinated to the USSR Ministry of Chemical and Petroleum Machine Building, and it operates on a khozraschet basis--it does contract work for the same enterprises it must monitor. Judge for yourselves how much objectivity there could be here. It would obviously make sense to subordinate this service, together with all of its equipment and personnel, to the Goskomgidromet [not further identified].

The draft Law on Protection of the Atmosphere foresees extensive rights for local soviets in the planning of nature conservation measures, and stiffer requirements upon the polluters. In order to achieve better use of these rights, we need to establish special environmental conservation sections in the oblast executive committees. We have created such a section under the oblast planning commission, but its status cannot be said to be appropriate to the level of today's requirements. Its staff is very small, it is impossible to clearly define the nature of its work, and the volume of the latter is very great--coordination of all nature conservation activities, plan coordination, inspection, and much else.

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CONSERVATION FORUM OPENS IN RIGA

Riga SOVETSKAYA LATVIYA in Russian 27 Feb 80 p 2

[Article]

[Text] The Second Combined Plenum of the Soviet National Committee for the UNESCO Program "Man and Biosphere" and the union republic regional committees for the same program was convened in Riga on 26 Feb. Ecologists, geographers, sociologists, and economists are taking part in its proceedings. They represent academic and sector institutes, institutions of higher education, and scientific production associations. The forum will last 3 days.

Academician V. Ye. Sokolov, chairman of the USSR National Committee for the "Man and Biosphere" Program, said the following in an interview with a LATINFORMA correspondent:

"Deep research on processes occurring in the biosphere under the influence of man's activities requires joint efforts by many countries. The UNESCO program includes 14 international projects foreseeing global ecological research. They are being conducted in the tundra and in the deserts, in forests and water basins, and in the mountains and on the islands. The Soviet Union occupies the leading position in terms of the breadth of the problems being studied (246 topics) and the volume of work."

Conservation of nature and sensible use of its resources are the principal objective of this long-range program. Soviet specialists are making a great contribution to completing the projects, and they have already achieved certain major successes. Our country, for example, has accumulated truly unique experience in development of arid land. Integrated research on cities as human habitats and development of biospheric preserves are acquiring increasingly greater significance. Protection of the Baltic Sea and its coastal zone from pollution has become one of the pressing problems. [5000/51-11004]

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FILTER DEVELOPED TO CLEAN LAKE BAYKAL

Moscow PRAVDA in Russian 12 Mar 80 p 2

[Article by Correspondent I. Lakhno: "A Filter for Baykal"]

> [Text] Tests on an experimental model of a new filter intended for purification of industrial sewage have been completed at Lake Baykal.
>
> P. Pradkin, director of the Ukrainian SSR Scientific Research and Design Institute of Chemical Machine Building, tells the story:

I would like to note that the new automatic filter is not any larger than the old models, but its productivity is twice as great. Its filtering surface has been enlarged significantly--a new design has been employed. Another unique feature of the filter is that it insures faultless purification of water, following which we are left with a dry sediment suitable for further industrial processing or utilization.

Dehydration of sediments "fished" out of industrial sewage has always been thought of as a complex problem. Besides the cumbersome filters, additional structures must be created. Our specialists have managed to solve this problem. For the first time in history, such a system, developed in our institute, was set up at the Baykal'sk Pulp and Paper Combine.

Then a group of specialists began working on a new order--creating a super-high-capacity filter for Lake Baykal. The collective of the filtering equipment section completed this task within short time. We know how important it is to keep the lake's water pure. Ten new filters will now be installed at the combine in parallel with the existing industrial sewage treatment complex. Lake Baykal will receive a guarantee against pollution by industrial production wastes.

The technical documents have been submitted to the Berdichev Progress Plant, which will initiate series production of the new filters. Various enterprises have already ordered them. The municipal services of Baku and Krivoy Rog were among the first to submit orders.
[5000/51-11004]

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ACADEMICIAN EXPLORES CONTROVERSIES IN NATURE CONSERVATION-EXPLOITATION

Moscow IZVESTIYA in Russian 16 Mar 80 p 3

[Article by Academician Ye. Fedorov: "The Path to a Balance: On Sensible Interaction of Production and Nature"]

[Text] Comrade L. I. Brezhnev's speech at the November (1979) Plenum of the CPSU Central Committee and the CPSU Central Committee and USSR Council of Ministers decree "On Improvement of Planning and Intensification of the Influence of the Economic Mechanism Upon Production Effectiveness and Work Quality" saddled Soviet scientists with serious tasks concerned with reinforcing the ties between science and production. A special session of a general meeting of the USSR Academy of Sciences held at the end of last year was devoted to this important issue. Special attention was devoted to the scientific aspects of interaction between production and nature, and of protecting and making sensible use of natural resources.

The national economy's consumption of natural resources has attained a tremendous scale, and it is having a significant influence upon natural conditions. Protection and sensible use of natural resources are mandatory prerequisites for development of the socialist economy, prerequisites that are spelled out in the USSR Constitution. They are documented by special legislation--on protection of forests and water and on sensible use of resources in the subsoil, in draft laws, presently under discussion, on atmospheric protection, on protection and use of the animal world, and others, as well as in a number of well known decrees of the party Central Committee and the Soviet government.

Each year the state allocates tremendous assets for these purposes. The amount stated as a specific item in the state budget for the year--about 2 billion rubles--is only just a part of these outlays. Measures implemented in recent years have reduced the total volume of some atmospheric contaminants and untreated sewage, even though production volume has grown. We can cite a number of examples in which enterprises are not only contaminating the environment to a significantly lower degree but are also enjoying a profit from trapping many valuable materials in the wastes. Thus the Voskresensk Minudobreniye Production Association of the USSR Ministry of Chemical Industry and other enterprises of this type are producing valuable chemical products out of gases which had formerly polluted the atmosphere. Just three enterprises of this sort alone are now producing about 8 million rubles worth of such products per year.

An example of sensible use of water resources can be found in transformation of the water cycle in the Gulf of Kara-Bogaz-Gol. It was believed for a long time that a large quantity of water had to flow into the gulf from the Caspian Sea each year to provide for the needs of chemical industry enterprises. An expert commission of the USSR Gosplan concluded on examining this question that the demands of the chemists were unjustified. A dam presently under construction, which separates the gulf from the sea, will keep more than 5 cubic kilometers of water out of the gulf and in the Caspian basin each year. As a result the level of the Caspian Sea will rise, given maintenance of the present annual river discharge into the sea, or it will stabilize, if discharge decreases by a few cubic kilometers per year due to natural causes or due to growth in water consumption for the needs of the national economy.

As we know, the issue of transferring part of the discharge of northern rivers in the country's European territory to the Volga is presently being examined in compliance with a decision of the 25th CPSU Congress. Estimates have shown that it would cost several hundred million rubles of capital investments to transfer such a quantity of water from the north. Cutting off the Gulf of Kara-Bogaz-Gol from the Caspian Sea would hardly solve the entire problem of providing fresh water for the southeast of the European USSR, but it will make the shortage less acute.

Both enterprise directors and state economic and planning agencies are arriving at increasingly more sensible use of natural resources, and they are making an increasingly greater effort to prevent the negative consequences of man's influence upon nature. But at the same time there are still many unsolved problems. Moreover the bulk of them are not at all the product of a lack of money or other serious objective causes; they are generated by a bureaucratic approach, by planning shortcomings, and by poor attention to timely conduct of the needed scientific research.

We still encounter cases in which industrial facilities accept and begin operating unfinished treatment facilities. According to the data of inspection organizations not less than 25 percent of the total volume of atmospheric pollution can be explained by faults in the treatment facility present at the enterprises, and by poor adjustment of motor vehicle engines. We could achieve a tremendous impact in reducing air pollution with relatively negligible outlays and efforts by reinforcing elementary production discipline.

I would like to turn attention at this point to some scientific problems that must be solved quickly if we are to achieve order in the interaction between the national economy and the environment. The first problem concerns the procedure for economic evaluation of natural resources and the consequences of the environmental changes which would arise in response to national economic influences.

It is understandable, for example, that we cannot halt pollution of atmospheric air and water everywhere right away. There must be certain priorities in the nature conservation measures. What is more important to preventing disease among the public and reducing the economic harm--halving the concentration of sulfur dioxide in air in one industrial center, or decreasing the concentration of nitrous oxides by a factor of five in another? What is the ratio between cost and economic benefit associated with changing a production process as opposed to introducing additional treatment facilities? Which should be done first, and which should be done next? It would be impossible to answer these and other similar questions without having a precise evaluation of both the natural resources and the harm economic activity could do to them. I will not attempt to suggest an opinion on a debatable issue: Should we or should we not exact payment for the use of natural resources? But without a doubt we must have some way for considering the economic impact resulting from their use, and the consequences of our influences upon the environment.

Work is now being done to develop the methods for making such estimates. Institutions of the USSR Academy of Sciences and the USSR State Committee for Hydrometeorology and Environmental Control should complete this work without delay jointly with local research organizations, and then test them out in concrete situations--in certain cities and industrial centers.

Let us look at a problem of a different sort, but also one demanding swift solution. The Sea of Aral is going dry because river water draining into it is being used extensively for irrigation. Estimates show that all that will be left of it in 20 years will be two lakes. Is this permissible or not? From my point of view development of irrigation is preferable to preservation of the sea. And even if our water availability were to increase later in this region (for example due to the transfer of part of the drainage of Siberian rivers), even then, I think, we should use it for irrigation. However, this is only an opinion. Many would probably agree with it. But not all. Some feel it necessary to restore the sea's fish economy. Others are concerned that winds may carry salt from the sea's drying surface to agricultural land. There are other considerations as well.

But is it not time to proceed from exchanges of opinions to resolution of the subsequent fate of the Sea of Aral--to selection of the variant which is optimum in ecological and economic respects?

Inasmuch as it would hardly be suitable to reduce the irrigated area, the principal task right now is to determine the possible negative consequences of the sea's demise, and work out the way to avert them. I suggest that the USSR Academy of Sciences could organize such work together with the academies of the Central Asian republics and the departmental institutes, and finish it in the next 2 or 3 years. As far as salt transferred by winds is concerned, the vast areas that have already dried out--the several thousand square kilometers around the same Gulf of Kara-Bogaz-Gol, the northeast part of the Caspian Sea, and the Sea of Aral--are entirely appropriate objects for study of this process.

Take another example--the Sea of Azov. Use of water from rivers draining into it for irrigation (which we must do to obtain rice and to increase the yields of other crops) has sharply diminished the inflow of fresh water. The sea's salinity is rising. This is causing valuable types of fish to die out and harmful jellyfish to propagate in enormous numbers. The biological cycle of the sea is deteriorating systematically.

At the same time we have it within our power to impose whatever cycle we deem suitable upon the Sea of Azov. For example we could increase the river discharge by transferring water from the Volga. However, this would hinder development of irrigation or reduce the level of the Caspian Sea. We could build a dam across the Kerch' Strait--the plans for it already exist. It would permit us to regulate salinity, but many scientists believe that this would lead to negative ecological consequences. Other proposals are being presented as well. But is it not time for us to go on from general deliberations to immediate completion of the appropriate studies, selection of the optimum variant, and development and approval of a plan for reconstruction of the Sea of Azov, to include its biological cycle? We should have had such a plan in our possession by now. This is a complex problem. It would be suitable to have the USSR Academy of Sciences coordinate research upon it in cooperation with departmental institutes.

The examples presented here demonstrate the following: The scale of our measures and structures is so great today that they are having a most serious influence upon natural conditions, and on the other hand they themselves depend upon the condition of the natural environment. The losses stemming from mistaken consideration of these consequences would total billions of rubles. Correspondingly, correct decisions would produce as great a positive impact.

Environmental conservation is still defined by many as preventing all changes in the environment, no matter what they are. It stands to reason that we do need preserves--zones that are protected completely or for the most part from the influences of man's activities. We need them as a means for preserving the genetic pool, and for many other important purposes. However, it would be impossible to transform the entire territory of the country into a preserve of untouched nature. Changes in the environment resulting from economic activity are unavoidable, and they will grow in the future.

When we plan various economic facilities, as a rule we estimate the immediate results of their operation rather precisely--for example we know how much additional agricultural product we would obtain from an irrigated area. But we do not devote enough attention to second- and third-order effects--for example an increase in the water table over a vast area around a reservoir, soil erosion resulting from imprudent cultivation of steppe land, development of huge masses of algae in water basins, and so on. This was all permissible in terms of the relatively small scale of nature transformation witnessed previously. Today, however, negative consequences of second and third order may turn out to be comparable in their significance to the purpose in behalf of which the entire effort is made.

The knowledge of the fact that this is true often leads to protests against interference in all natural processes in general, to groundless apprehensions of the worst. From my point of view the crux of the matter does not lie in the debate between the gross violators and the delicate protectors of the "natural balance." If we are to insure sensible interaction between production and nature, we would have to account for and reckon with all environmental phenomena that will arise in connection with the future object or measure, and we must do so early, in the planning stage. We are not using our existing knowledge adequately enough for these purposes. At the same time we must broaden research in ecology, since estimation of the changes which transformation of the environment causes in the community of living organisms is the weakest link in such problems.

From my point of view the "natural balance" is not a frozen state of nature--present or past, but a state of continuous change, of balance in all of its parts, harmoniously combining the natural and anthropogenic processes. We must not allow formation of ecological dead-ends, and we must not permit "surplus" materials and substances to be dumped in the environment. I believe that our science and technology have it completely within their power to solve these urgent problems.
[5000/51-11004]

11004
CSO: 5000/51

WORLD CONSERVATION STRATEGY PROCLAIMED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Mar 80 p 3

[Article: "In the Interests of All Mankind"]

[Text] On all continents, in different corners of the earth, the 5th of March has become a day of solemn ceremony devoted to proclaiming the world strategy of nature conservation. This international proclamation expresses the world's collective concern for the status of the conservation of nature's living forces, and it offers a program of measures directed at intensifying nature conservation.

The strategy was formulated by the International Union for the Protection of Nature and Natural Resources (IUPN) with the advice, cooperation, and financial assistance of the UN Environmental Program (UNEP) and the World Wildlife Protection Fund (WWF), as well as with the approval of the UN Food and Agricultural Organization (FAO) and the UN Educational, Scientific, and Cultural Organization (UNESCO). This program document was reviewed and approved by the 14th General Assembly of the IUPN, held in Ashkhabad (1978), and later finalized and coordinated with other international organizations.

At a public meeting held in Moscow, the audience was greeted in behalf of the IUPN by its vice president and chief of the USSR Ministry of Agriculture Main Administration of Nature Protection, A. Borodin. He and other speakers noted that the proclaimed strategy was an accumulation and expression, in concentrated form, of the world's experience in nature conservation. Thus states have now achieved the possibility for selecting the best ways to attain dynamic harmony between society's development and preservation of the favorable properties of the national environment.

A favorable legal state system has been created in the Soviet Union and in socialist countries, the speaker emphasized, and they possess all the necessary conditions for implementing, consistently and fully, the world nature conservation strategy.

The speakers laid special emphasis on the fact that environmental conservation measures are being tied in closely in our country with the Program of Peace and with relaxation of international tension. In 1979 Comrade

L. I. Brezhnev wrote in a letter of greeting to participants of a European summit conference on cooperation in environmental conservation: "We are not only implementing a broad program of nature conservation and sensible use of natural resources here in our country, but we are also actively cooperating with other countries in environmental conservation, and we are ready to develop this cooperation further." It is precisely to such cooperation that the strategy proclaimed on 5 March devoted exceptionally great attention.

Confidence was expressed at the Moscow meeting that the Soviet people will be the first to actively fight to implement the provisions of the world nature conservation strategy for the good of all mankind, and for the good of peace on earth.
[5000/51-11004]

11004
CSO: 5000/51

BRIEFS

HURRICANE--Yuzhno-Sakhalinsk--A mighty cyclone carrying a wealth of snow descended upon islands of the Kuril chain last night. In certain areas the winds attained 150 kilometers per hour. The oblast disaster control headquarters reported that the cyclone is displaying special fury on the islands of Iturup and Shikotan. School has been canceled and children's day schools and nurseries have been temporarily closed in all population centers. A number of places have experienced power cut-offs and interruptions in telephone communication; hurricane winds have torn roofs off of homes in some places. Kuril islanders are opposing the blows of the elements with steadfastness and organization. Emergency teams are being created in places struck by the hurricane to clear up the aftermath of the cyclone as the winds die down. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Mar 80 p 4] 11004

UNDERGROUND JOLTS--Baku--An earthquake was registered in the Nakhichevan ASSR at 0657 hours Moscow time yesterday. Its epicenter was in Iran. According to a report from the Nakhichevan' Seismic Station the intensity of the underground jolts in different regions of the autonomous republic was 3-4 points on a 12-point scale. The quake did not cause significant damage, and there were no injuries. [Text] [Moscow TRUD in Russian 26 Mar 80 p 4] 11004

AVALANCHE PREDICTION--Experts of the Kirgiz SSR Republic Hydrometeorological Service have drawn up a map showing avalanche danger in the mountains. Just last winter alone about 4,000 avalanches were registered in the Tien Shan Range. The experts estimated that more than 90 million cubic meters of snow plummeted down from the mountains. Avalanches sometimes do damage. To prevent this, we must know beforehand where and when an avalanche would arise. Workers at avalanche stations in the mountains are monitoring snow accumulation, and they are transmitting warnings of impending danger. Original methods developed in the Kirgiz SSR for predicting avalanches are being used along the Baykal-Amur Rail Trunkline and in Siberia. The republic's experts have compiled an avalanche cadaster for the entire country--this is essentially a summary of all basic information on this dangerous phenomenon of nature. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Feb 80 p 4] 11004

WATER TREATMENT--Kramatorsk, Donetskaya Oblast--The pumping and filtering plant that has just been put into operation will provide completely for the drinking water needs of the city's residents. The water came here via a 20-kilometer pipeline from the reconstructed canal linking the Northern Donets to the Donets Basin. The new enterprise, which has a capacity of 50,000 cubic meters of water per day, is outfitted with automatic equipment. This clean water factory is one of the facilities erected according to the plan for general reconstruction of the Northern Donets-Donets Basin canal. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 26 Mar 80 p 1] 11004

UNDERGROUND QUAKES- Baku, 25 Mar (TASS)--An earthquake was registered in the Nakhichevan ASSR at 0657 hours Moscow time today. Its epicenter was in Iran. According to a report from the Nakhichevan' Seismic Station the intensity of the underground jolts in different regions of the autonomous republic was 3-4 points on a 12-point scale. The quake did not cause significant damage, and there were no injuries. [Text] [Yerevan KOMMUNIST in Russian 26 Mar 80 p 4] 11004

VOLGA WATER TREATMENT--Kuybyshev--The barrier to the Volga's pollution has been strengthened at the Tol'yatti nitrogen plant. A third generation of treatment facilities has been put into operation here. They now process about 100,000 cubic meters of production wastes each day. Such facilities, which are also operating at the Volga Motor Vehicle Plant, the Kuybyshev Petroleum Refinery, and other enterprises have become the guards of the great Russian river's purity. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jan 80 p 2] 11004

METALLURGICAL WASTE SYMPOSIUM--Donetsk, 14 Mar (RATAU)--Donetsk, the center of a major industrial region which is presently smelting 1 out of every 7 tons of steel in the country, has become a unique laboratory of progressive techniques in nature conservation. An international symposium of CEMA countries and Yugoslavia on problems associated with protecting the environment against harmful wastes from ferrous metallurgy enterprises ended its work here today. Reports and messages presented by participants of this convocation--scientists, specialists in engineering ecology, and creators of wasteless production processes--reflected the progress in fulfilling an elaborate program of long-range cooperation among socialist states in solution of global issues concerning protection of aerial and aquatic basins at the locations of large industrial complexes. Much attention was devoted to implementation of measures aimed at processing the byproducts of ferrous metallurgy. The symposium's participants examined an exhibition reflecting the best achievements in creation of high-capacity treatment complexes, and waste utilization methods. At the Donetsk Metallurgical Plant imeni Lenin the guests acquainted themselves with the latest protective resources making it possible to neutralize the effects this enterprise has upon nature. Visitors to laboratories of the Donetsk branch of the All-Union Chermetenergoochistka Scientific Research and Planning Institute showed an interest in promising projects associated with desalinazation of waste water and recirculation of thermal and material wastes from processes involved in the acquisition of various types of metallurgical products. The symposium's proceedings defined the main directions to be taken by socialist countries during the next decade in environmental conservation. [Text] [Kiev RABOCHAYA GAZETA in Russian 15 Mar 80 p 1] 11004

WEATHER REMAINS CONSTANT--V. Skhabitskiy of Vorkuta asks why torrential rains, hurricane winds, and blizzards have been so frequent on our planet in the last 2 or 3 years. His question is answered by Candidate of Geographic Sciences M. Sorochinskiy, director of the USSR Hydrometeorological Center Laboratory: "I should state first off that the frequency of rains, blizzards, and high winds is not exceeding the usual norm. We are simply receiving more information today about various changes in the weather. While in previous times a phenomenon occurring in some regions remained known to residents of only that locality, today we are observing meteorological phenomena in all corners of the globe, and the most interesting weather phenomena are coming within the awareness of the broad public. This is obviously one of the reasons for the apparent increase in rains, storms, and winds. Moreover we have meteorological records for only a period of a hundred years. Thus we can compare weather conditions only within this time interval." [Text] [Moscow TRUD in Russian 27 Mar 80 p 6] 11004

POLLUTION ANALYZER--Colleagues of the Tadzhik SSR Polytechnical Institute have simultaneously completed an ecological and a technical task. They have created an instrument which can quickly reveal the causes of fuel overconsumption and heightened discharge of toxic gases into the atmosphere by motor boats, diesel locomotives, and other transportation resources. The new analyzer, which is a little larger than a pack of cigarettes, will help improve the work of the tremendous fleet of BelAZ trucks, KamAZ trucks, and tractors--all vehicles in which diesel engines are installed. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Mar 80 p 4] 11004

MEASURES TO PROTECT THE AKROPOLIS FROM POLLUTION

Athens TA NEA in Greek 15 Apr 80 p 11

[Text] A trolley line will be constructed along Dionysiou Areopagitou Street, to serve visitors to the monuments of the Akropolis so that gradually the tourist buses can be eliminated. At the same time, the utilization of coal gas is being studied for heating and other household uses in the Akropolis zone, where a coal-gas network has already existed for a long time now. These measures are connected with two new decisions which were made at a conference which took place yesterday, following the visit of Premier Karamanlis to the Akropolis. During the conference, previous decisions were also ratified in connection with measures which must be taken to protect the monuments from the atmospheric pollution of Athens.

The premier inspected the work being done on the Erekhtheion and the Parthenon, as well as the restoration projects which have begun at the same time on the Theater of Dionysos and on the ancient promenade around the Akropolis. During the conference which followed the premier's visit, certain new decisions were taken.

Specifically:

The Athens Public Gas Corporation (DEFA) will be moved to Aigaleo in accordance with the study already worked out, which provides for a level of investment of 330 million drachmas for this purpose, while by 1985 the Keratsinion plant of the DEI [Public Power Corporation] will have been transferred to Lavrion, and one DEI station will remain at Keratsinion only for service during peak consumption periods. It has been asserted in this connection that 50 percent of the atmospheric pollution which comes from the broader Piraeus area is due to this DEI unit.

It was decided to completely replace petroleum for heating and other household uses by coal gas in the area around the Akropolis, which has been designated the Akropolis zone. As is known, the use of mazut in the Athens area has been banned for the last 2 years, and the petroleum now being used for heating, which we import from Libya, has a low sulfur dioxide content.

As for the pollution which is produced in the atmosphere around the monuments of the Akropolis from city automobile traffic, tourist buses, and trucks, the decisions are basically the following:

The extension of the new Petralona trolley line to an additional station near the Akropolis, in order to serve visitors to the monuments so that the tourist buses can be eliminated eventually.

The reorganization of the bus lines in this area so that buses will not pass close to the Akropolis.

The banning of parking by trucks near the archeological areas.

Taking part in this conference, which was held under the chairmanship of the premier, were Minister of Culture Nianias, Minister of Industry M. Evert, the technical adviser to the premier, L. Kyriakopoulos, members of the Akropolis working group, the professors K. Konofagos, Th. Skoulikidis, and I. Travlos, the conservator of the Akropolis, G. Dondas, and others.

In the course of the conference, Mr Karamanlis called for the completion by the Akropolis working group of the study and the remaining restoration projects which must be done on the Parthenon and the Propylaia. Concerning these projects, the premier asked that a memorandum on their scheduling be submitted to him within the next 15 days, which will have to do with the time period for their execution, the estimated expenses, and the administrative measures which ought to be taken.

In stressing the intention of the government to support the work on the restoration of the monuments of the Akropolis, Karamanlis said in response to a journalist's question that: "I have told the scientists and technicians involved in this matter that they will have whatever they ask of me, both with respect to crediting and with respect to procedures and jurisdictions, so that the work of protecting the monuments at the Akropolis can be accelerated."

In any case, it is recalled that all the work which is being done on the monuments of the Akropolis and in the surrounding area is being financed entirely by the Greek State, whereas the sum which had been collected earlier for the same purpose from UNESCO will be used for the establishment of a large center for studying methods of preservation of ancient monuments and for studying stone preservation problems.

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CSO: 5000

SALONICA GULF POLLUTION REPORTED

Athens I AVGI in Greek 11 Apr 80 p 2

/Text/ Industrial wastes, city refuse and dangerous toxic gases which are channeled daily in greater quantities into the Thermaikos Bay constitute a permanent pollution source for the area.

Recent measurements have shown that about 150,000 cubic meters of city refuse and industrial wastes are channeled daily into the Salonica Gulf alone, while the area's atmosphere is filled every day with immense quantities of sulfur dioxide and monoxide, hydrocarbons, nitrogen oxide and floating particles. The liquid industrial wastes represent about 45 percent of the total volume of the city's liquid wastes and 30 percent of the organic load channeled into the Thermaikos Bay.

Since the industrial plants are widely dispersed in the greater Salonica area it is difficult to pinpoint all sources of industrial waste outflow. As a result, the pollution of the sea and atmosphere is becoming more and more acute. Since the measures thus far taken for coping with the problem are considered insufficient, it is necessary to prepare an economic and technical study for coping with the pollution which threatens the greater Salonica area. The study and the subsequent decisions to be taken should provide solutions to the two problems which are the main reason for the area's pollution: the problem of processing and disposing of the liquid wastes and the questions of organising industrial areas where the whole industrial activity of the area will be concentrated. The most important initiative the public administration should consider is the joint treatment of the industrial wastes and city refuse and their channeling to the sewage system of the Salonica Drainage Organisation.

A group of experts who studied the whole problem have submitted to the Ministry of Industry the following proposals for eliminating the pollution in the Salonica area:

a. An inventory should be immediately taken of all industrial outflows along the tributaries which have become open sewers in order to solve the probl [illegible] malodorousness and save the area's landscape.

b. All tanneries should be moved to a separate zone where complete installations for treating the liquid wastes must be constructed.

c. On the basis of a specific study the Kalokhori area should be established as an industrial zone for accommodating all industrial units planned for the area.

For controlling the dangerous toxic wastes which to a certain extent are channeled unchecked to the sewage system, the sea and other completely unsuitable areas, it is proposed to establish a special treatment unit far from inhabited areas.

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CSO:5000

AREA VULNERABILITY TO EARTHQUAKES ANALYZED

Athens TA NEA in Greek 3 Apr 80 p 11

/Article by Correspondent And. Peklaris: "The 'Enemy' Which Threatens the Balkans"/

/Text/ Salonica, from our correspondent--Cooperation among the Balkan states does not constitute only a historic need. It is also dictated by nature. Because, in addition to anything else, it is their fate to jointly cope with a "beast" which literally roars threateningly in their bowels--the earthquake.

The "nerves" of this beast, the so-called seismic zones, are branching out like long and broad beds of underground rivers, along the length and breadth of the /Balkan/ peninsula "connecting" it to a body which often and almost at regular intervals shows uniform pathological symptoms: the earthquakes.

The Balkan peninsula represents about 80 percent of the earthquake activity in all Europe. Statistically, the earthquakes occurring in the area (including only the northern part of Greece) show the following time and intensity ratios: An earthquake measuring 6.5 on the Richter scale occurs every 2 years, one measuring 7 on the same scale every 7 years and one having an intensity of 7.5 every 23 years.

Two Main Zones

On the basis of modern accurate estimates of the various seismic sources, the major and most active seismic zones which "connect" Greece with the other Balkan states are two:

The first follows an intelligible line along the Adriatic and Ionian coasts (western Yugoslavia, Albania, Ipeiros), traverses the Ionian islands, embraces the western and southern Peloponnisos, passes Kythira, then north of Crete and south of Rhodes and terminates in southern Turkey. Somewhere in Ipeiros this major zone splits into two "smaller" ones: an external one along the coasts--it caused the strong earthquakes of last

April in Montenego--and an internal one which follows the Ipeiros-eastern Albania-Yugoslavia line and which caused the 1963 destructive earthquake in Skolpje [Yugoslavia].

The second zone is in northern Greece and it is this one that "hits" Salonica. It is a circular zone which encircles the Rodopi Mountain range. Its northern sector follows the Evros River valley into Bulgaria and caused the strong earthquakes of 1928 (7 and 6.8 on the Richter scale) which destroyed Filippoupolis. The western sector of this zone is the one known as "Serbo-Makedonian" zone and caused the strongest surface earthquake (less, that is, than 60 kilometers in depth) that has ever been felt in Europe: the Kresna earthquake (7.7 Richter; on 4 April 1904). At that time another strong earthquake (7.1 Richter) had preceded the strongest one (by only 23 minutes). This same zone precipitated the Ierissos earthquake (6.9 Richter, in September 1932) and the recent Salonica earthquake (6.5 Richter, on 20 June 1978).

This Serbo-Makedonian zone follows the known "line" from Bulgaria (Kresna), passes by Kilkis, through the Volvi and Langada Lakes, then to Ierissos, to the foot of Athos Mountain, sinks into the Aegean and then veers eastward, passes through the North Aegean Sea and continues into northern Turkey. The southern sector of this zone caused the 1965 earthquake in the Samos Bay (Turkey) which was surprisingly similar to the Salonica earthquake. Its intensity was 6.5 on the Richter scale, it was preceded by a big pre-quake (5.7 Richter) and it was followed by many after-quakes, the strongest of which registered 5 on the Richter scale.

This same southern sector of the zone caused in 1912 an earthquake of 7.6 Richter in Turkey, and another one which destroyed Samothrace. During the 18th century it caused terrible earthquakes southeast of Thasos. Finally, it is possible that this same zone caused the 1829 earthquake which destroyed Drama.

The main characteristic of the earthquakes in both the above mentioned zones is the small depth of their source (an average of 20 kilometers). This means that they are very dangerous to a small area near their epicenter but not to places far from it.

Only one earthquake of intermediate depth (more than 60 kilometers, that is) was felt north of Sithonia (6.1 Richter at a depth of 80 kilometers) but the available data about it is limited. It occured in 1947.

A third large Balkan seismic zone is found exclusively in Romania. Its main characteristic is that it precipitates earthquakes of intermediate depth (100 to 150 kilometers). For this reason it oftentimes causes great damage in distant areas. An example is the 4 March 1977 earthquake which destroyed Bucharest even though its epicenter was 180 kilometers away.

This characteristic is of interest to us also since in southern Greece too (the Kythira, Crete, Rhodes line) earthquakes of intermediate depth are taking place, a fact which in the opinion of experts needs special attention. In the past, this zone has produced strong earthquakes (up to and including 8 Richter at Kythira) and naturally it is possible that similar ones may occur in the future.

Of course, the "target" of an earthquake of intermediate depth depends on the direction of the rupture at its source. And even though we have confirmed cases of damage to northern areas, there is, however, one which caused great damage to...Cairo, at a distance 800 kilometers from the epicenter of an earthquake in the Aegean.

"Emigration" of the Epicenters

The southern boundary of the seismic area of the Balkans and northern Greece is defined by a fourth large zone, the Thessaliki, which follows a line which starts at the Karditsa heights and follows to the east (Volos, northern Sporades, Mytilini, western Turkey). It is mentioned in this article mainly because this zone too has a characteristic common to certain zones: it is the so-called "emigration" of the earthquake epicenters alongside the zone to which they belong.

An impressive example as concerns the Greek space is the "emigration" of the epicenters alongside the Serbo-Makedonian zone. This phenomenon was observed between the years 1902 (at Askro, northeast of Salonica, 6.6 Richter), 1904 (Kresna) and 1905 (Mt. Athos, 7.4 Richter). Another example is the earthquakes which started in 1954 in the Thessaliki zone (Sofades, 7 Richter) and "emigrated" eastward (Volos, 1955-77), northern Sporades (1964, 1965, 1967, 1968) and western Turkey (1969, 1970 and 1971).

Many Small Ruptures

Besides the ruptures of the aforementioned four large seismic zones, there exist smaller ones which on occasion cause earthquakes of smaller intensity. According to certain scientists, the 1829 earthquake which destroyed Drama and caused damage to Xanthi was caused by such a small rupture which is parallel to the southern section of the Serbo-Makedonian zone (in the North Aegean). The 1940 earthquake in Katerini was perhaps caused by such a small rupture. It registered 5.2 on the Richter scale.

Causes—Forecasts

Generally considered to be the basic cause of the great frequency of earthquakes in the area is the gradual convergence between the African and the Euroasiatic lithospheric plate as well as the movements of smaller rigid lithospheric plates in the area.

(Editor's note: By a lithospheric plate is meant the fragmented form the earth's crust shows at a small depth under the surface and which reminds one--a crude example--of the iceberg at the poles. As they move slowly, these fragments--lithospheric plates--occasionally collide, thus creating earthquakes. One could say that the gaps between these plates are the seismic zones.)

But the exact course of the seismic zones is not determined only by the geotectonic causes which affect the region (such as the motion of the lithospheric plates) but also by the geological history of the petrification in the area. The seismic zones, as an example, also follow the weak geological zones, that is, petrification with poor strength. This is one reason why the assessment of the seismic sources of the area is complicated and, by extension, why their explanation is difficult...

The fact that the major seismic zones of the area have been determined with relative precision puts on a somewhat steady basis the question of forecasting the earthquakes. Because it is important to know where the earthquakes take place and therefore which areas must be studied in greater detail.

Besides the need for the Balkan nations to broaden the research on earthquakes, Greece should be selected as the center of the corresponding research programs EEC is preparing because it would be useless (if not ridiculous) if such a program is initiated in any EEC country other than Greece.

In any case the existing data, useful as they are, are not sufficient for earthquake forecasting in the future. It is necessary to have detailed local research (seismological, geophysical, geodetical, geological) which up until now has not yet begun in Greece. The view that an accurate method of forecasting if discovered abroad will also be introduced here is not plausible for the following two basic reasons:

First, it will be necessary to have sufficient and exact data regarding any region in order to apply there any method which may be invented in any part of the world. Second, the Greek scientists will not be /scientifically/ prepared to use this method unless they themselves make some contribution through their participation in the international effort.

From this point of view, the seismological network established in northern Greece with seven regional stations around the Salonica seismological center will be a first serious step in an effort to carry out research and to cope effectively with the earthquake problem in the Balkans. To this end, it is necessary to accelerate the promotion of the whole project.

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ENVIRONMENT AGENCY TO TIGHTEN WATER COURSE INSPECTION

Oslo AFTENPOSTEN in Norwegian 26 Mar 80 p 4

[Article: "Pollution in 30 Water Courses Will Be Monitored"]

[Excerpt] The National Pollution Inspection Agency will start a nationwide monitoring program for pollution in fjords and water courses. The work has already started in the Halden water course. During the spring and the summer plans are to follow up with investigations in approximately 30 fjords and water courses all over the country, according to information received by the Norwegian Wire Service.

The National Pollution Inspection Agency has a good 7 million kroner available this year for this purpose. The practical investigations will be carried out by the Norwegian Institute for Water Research and professional people associated with the county municipalities.

The purpose of the program is to follow the development of the water quality in polluted fjords and water courses. Measurement stations will be established in each body of water, and water tests will be made at intervals of from 1 week to 1 month. The work is intended for a very long range, and the intention is to expand the monitoring during the next couple of years to cover a total of approximately 100 bodies of water.

In addition to this monitoring program, so-called basis investigations will be carried out.

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CSO: 5000

SULPHUR DIOXIDE FROM ABROAD CAUSES FISHLESS WATERS

Oslo NORGES HANDELS- OG SJOFARTSTIDENDE in Norwegian 15 Mar 80 pp 1, 7

[Article: "The Acidic Precipitation over Norway: The British Are the Main Culprits. But the Central Europeans Come a Close Second"]

[Text] From the NORGES HANDELS OG SJOFARTSTIDENDE traveling correspondent John Roos.

Sandefjord--It is only necessary to study the weather maps in order to find out who gives us the biggest contribution in the form of sulphur dioxide. The British clearly stand out as the biggest contributors. And the prospects for the future are frightening: more than 60 percent of all lakes investigated in the four southernmost counties in our country are now empty of fish, and an additional 20 percent will become empty if the tendency continues.

It is research assistant Helge Leivestad from the Zoological Laboratory in Bergen who tells us this in a conversation with NORGES HANDELS OG SJOFARTSTIDENDE during a break in the "acidic precipitation conference" in Sandefjord. He has participated in this research project, which is Norway's biggest ever measured both in money and man years.

"For a zoologist who looks after fish it is an ugly trend we detect when we study acidic precipitation and the stock in Norwegian fishing lakes," says Leivestad. "The whole thing exploded after 1960," he says, and shows us curves which are based on reports going back all the way to the 1930's. They go up steeply after 1960.

Leivestad says that approximately 4,000 lakes in parts of Telemark and Rogaland and in all of East and West Agder have been investigated. This is where 60 percent of all lakes are empty.

"The 20 percent which are affected have fish, but now something is starting to happen to the fish stock--they are so-called 'thin lakes,'" says Leivestad.

Leivestad shows how our empty fishing lakes after 1960 correspond to the build-up of industry and the discharge of sulphur since that time. The reason is the direct combustion of coal and oil, and he does not have much faith in any quick improvement:

"We cannot expect any quick change in the pattern for the discharge of sulphur in England. We here have a group from the British National Power System, and they are in any case concerned about the development, but the Central Europeans, who also contribute to the sulphur precipitation over Scandinavia, do not seem to be especially concerned about what is taking place up here. We researchers have not had much contact with the countries in the south, but in any case, our British colleagues show signs of bad conscience," says Leivestad.

New Impulses

As one of the many participants in the Norwegian project, Leivestad says that it has been excellent since it has broken down barriers between relatively small and narrow research environments.

"Here we have worked together in a team, meteorologists with water chemists and forest people, soil people with zoologists--we have been shaken together, and the whole thing has given many new impulses and meant that research projects have received a breadth and a value which has received international attention," says Helge Leivestad.

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CSO: 5000

STOCKHOLM TO TRACE SOURCES OF ILLEGAL TOXIC WASTE DUMPING

Stockholm DAGENS NYHETER in Swedish 8, 9 Apr 80

[Series of articles by Gun Leander]

[8 Apr 80, p 5]

[Text] 12,000 Tons of Waste Poison City

The municipality of Stockholm is going to initiate a major offensive against environmentally dangerous waste. It is hoped that by active work in the field it will be possible to detect environmental problems industry by industry. First of all, the graphic arts industry will be surveyed. In Stockholm alone about 5000 firms produce waste harmful to the environment: 5000 tons of solvents, 108 tons of waste containing cyanide, 644 tons of dye, glue, lacquer, 304 tons of finishing waste.

That is a portion of the annual environmentally harmful waste in Stockholm. The total involves annually some 12,000 tons of harmful waste. But no one knows exactly how much waste is properly disposed of and how much is illegally dumped. That is the problem with which the municipality of Stockholm must deal.

In 1976, Stockholm established, to be sure, a collection monopoly for environmentally dangerous waste. But the health service inspectors have had other tasks, and inspection has been poor. The health service administration has obtained a new position for a chemical engineer, and 30 health service inspectors have received special training to go out into the field.

Heavy Metals

We chose to begin with the graphic arts industry which is one of the biggest in Stockholm and uses many chemicals," says Sune Larsson, a chemical engineer in the Environment and Public Health Department.

Large quantities of solvents are used in the finishing industry, in automotive repair shops and in the graphic arts industry. Much too large quantities today go into the sewage system to the treatment plants which only provide biological purification. Heavy metals go into the sea and are concentrated in vegetation and animals. Sludge from the treatment plants is used in agriculture, on the city's own plants, etc. The high content of heavy metal has resulted in the sludge being regarded as on the verge of being unusable. The Public Health Department's campaign against environmentally dangerous waste is a way to obtain cleaner sludge from the sewage treatment plants.

Waste that is definitely undesirable occurs in the graphic arts industry: engraving baths with heavy metal, organic finishing material, paint residues and lubricating oil.

They don't want to consider themselves as "environmental police"--in the beginning.

"Often ignorance is the cause for discharges," says Greta Suven, a chemical engineer. "It even happens that firms empty fixing baths containing silver without knowing that can make money by selling it. Our job is to survey the industry, to come forward with proposals and advice. Then after that there can be the question of inspecting to see that they abide by the suggestions."

The Environmental and Public Health Department hopes to finish up with the roughly 1,000 firms in the graphic arts industries in a year. It is not clear which industry will be next.

The automotive repair, finishing and lacquering industries are interesting from the waste point of view. One result of the new approach by the municipality can be more self-contained systems, better purification and paradoxically new environmental problems. What shall be done with the separated waste?

"Resources today are too small in regard to the treatment aspect," Sune Larsson says. "It is not clear what will happen to the waste which can't be recovered. The industrial distillation plant at Lovsta is unsuitable and should be shut down at the turn of the year. Otherwise there is a great risk in regard to the air and to the water of Lake Malaren. We want the SAKAB [Swedish Waste Conversion Company AB] to examine as soon as possible the proposal for an intermediate storage facility for waste in the region. Otherwise there is a risk of a gigantic transportation problem."

Illegal Dumping

Only 11 firms today have municipal permits to transport environmentally dangerous waste. If an accident should occur, they can show exactly what their cargo is. But both illegal transporting and dumping take place in the areas where the authorities have no control.

One proposal is that the legal transporting firms introduce scheduled collections in all of the city's industrial areas in order to avoid illegal dumping.

But up to now nothing has been done. Paint residue splashes, and cans are a big problem in Stockholm today. Households can leave their medicinal residues at drugstores, and paint residues and pesticides at regular paint dealers. But the municipality has only an oral agreement with the paint dealers who sometimes complain about having to serve as storage places. And SAKAB is not happy about small buckets of "mixed wastes."

"We are considering tightening up our activity even in regard to environmentally dangerous household waste," says Sune Larrson. "Perhaps, written agreements with the paint dealers are needed."

The big problem is not the discharge of environmentally dangerous waste but that certian materials may be used at all," says Bjorn Wallgren of the industrial sector in the nature conservation unit in the Provincial Government Board.

"The risk of serious environmental accidents occurring in the illegal transporting is not the most serious problem. Environmentally dangerous waste constitutes only a small part of all pollution in nature."

The provincial government board is the highest decision-making authority for carriers who want to handle environmentally dangerous waste. Up to now no one has received a negative answer. There are no resources for police inspection.

The provincial government wants to determine if industry is complying with the requirements of the law for the protection of the environment. The handling, transporting and final disposition of environmentally dangerous waste will also be checked.

Three Purification Plants

Up to now, no one has been caught dumping, for example, hydroxide sludge, in the sea, but if it should occur, it would be a serious matter. The sludge contains heavy metals which never disintegrate because they are the base substances. Substances such as quicksilver, cadmium and lead remain in nature for all time and are enriched.

"Any talk about the destruction of heavy metals is really misleading," says Bjorn Wallgren. "What happens is that the waste is moved from one place to another. The best thing would be retrieval, but when several substances are mixed up in the sludge there is no method. The next best thing is to deposit it in a proper environmental place."

A working group from the three sewage treatment plans of the Stockholm area has been created on the provincial government board to map out from where the high percentage of heavy metals in the sludge come. How much comes directly from industry, and how much for example via rain. Bjorn Wallgren believes that more care should be exercised when using in production basic substances which are rare in nature. Copper roofing, galvanized pipes, chemicals from households can together constitute large quantities of poisonous substances going into the ordinary water. PCB, many pesticides and cadmium are prohibited in certain areas in Sweden. But for a long time after a prohibition comes out, products containing these dangerous substances are on the market.

The requirement that non-destructable substances should not be used in industry should be more strict, according to Bjorn Wallgren. Many substances are difficult to control in regard to their capacity to break down, for example, photographic chemicals of which there are a lot in Stockholm. Among the international economic organizations the OECD is just now deciding what substances are difficult to break down and hence should be replaced. After clear confirmation the provincial government boards will send out lists of non-desirable substances to the industries.

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[Text] Thousands of Tons of Waste Illegally Transported Through the City

The illegal transportation of environmentally dangerous waste goes on daily in Stockholm.

"Ninety percent of the truck drivers who come here can't tell you clearly what their load is," says Sven Lundberg of the Industrial Distillation Corporation in Lovsta.

"Rather than having them dump solvents in the sewer or throwing barrels of poison in the ditch, we accept it, although actually we should refuse to do so."

The municipality of Stockholm has had a monopoly on the collection of environmentally dangerous waste since 1976. It is not allowed for any other but the 11 firms on which the municipality relies for picking up and transporting environmentally dangerous waste.

Only four firms may collect the worst kinds of waste: quicksilver, cyanide, PCB and pesticides, etc. Yet, many trucks with dangerous loads drive around our densely populated areas. The Environmental Protection Agency calculates that in the country as a whole 100 illegal firms transport waste. The risk of detection and fines is minimal.

DAGENS NYHETER accompanied one of Ragn-Sell's trucks one morning. The firm is one of those which may transport all kinds of environmentally dangerous waste.

"It is only a matter of time before there will be an accident, with all the chemicals that are being transported illegally," sayd Mikael Sodergren who drives the especially equipped vehicle. Outwardly the vehicle looks like a normal truck except for signs. Orange signs with different numerical combinations indicate what dangerous wastes are involved.

The Average Swede Pours Waste Down Sewers

If the fire department has to go out, it must be immediately informed regarding the danger of the cargo. There must be in the cab transport cards and declaration blanks with full details.

If any barrel starts to break Mikael has a protective suit to put on.

"I appreciate that it is easy for an ordinary Swede to pour the waste down the sewer, troublesome as it is to dispose of it," Mikael says.

If solvents, for example, get into the sewer, it will go to Henriksdal where it is cleaned. The sludge being used in agriculture has already too high a heavy metal content to be utilized. Most of the waste is not removed by the biological purification but goes directly into the sea.

"It has happened that it has been necessary to return with the waste because the blanks are not filled out correctly. We have little possibility for determining if the firm's information is correct. Often mixed loads are involved.

"You have to be a trained chemist to understand how dangerous the combination is."

Rust on Barrels Concealed with Paint

The truck turns into the yard of SRA [Government Printing Office] in Kista. The firm makes among other things automobile radios and wants to get rid of small quantities of mixed solvents and paint residues: 15 full barrels with the covers on some buckling and sundry rusty paint cans. It is routine for Mikael Sodergren. He has been working since 1972, chiefly cleaning oil tanks.

He tells about a firm which was ordered to repack its environmentally dangerous waste but only painted over the rust with lacquer. When Mikael lifted the barrels, they broke, and the solvents flowed out.

The most rusted containers at SRA have been there a year.

"We tried to get rid of the containers at Lovsta last year, but we had to take them back because the forms were not correctly filled out," the firm says.

The vehicle is marked 33, meaning inflammable. Eighteen hundred liters of dangerous and inflammable material of low viscosity are driven from Kista to Industrial Distillation AB through idyllic residential areas.

Stinking Solution and Hissing Steam

"In any case, it is easier to cope with a collision igniting the load than a spillage of waste containing cyanide," Mikael Sodergren says. The Industrial Distillation AB stinks of solvents and diesel oil. Steam from burning the infectious waste from hospitals pours from a high chimney.

Sven Lundberg sits in a shed and accepts the waste. After some confusion it is apparent that the most important form which the firm should have sent in got by mistake to a neighboring barracks. It will cost SRA about 4000 kroner to get rid of the barrels, not including freight.

"This may seem excessively bureaucratic, but we must know in advance what we are getting," says Sven Lundberg, who is also chief safety officer. "It is partly a matter of working conditions, and also we can store just so much waste."

Mikael gets help from a truck driver to put the barrels on the oil-spotted ground. Some will be burned in the ovens, some will be emptied into containers and checked very closely, and some will be distilled to obtain purified raw material.

Suddenly two fellows appear and ask permission to unload "some barrels." They are from Lintaverken in Bromma and have no idea what their load is. They say that they usually deliver suitcases. The fellows don't have any transport cards and explain they are not concerned what would happen if they had an accident, "Ah, we won't have an accident," they say. Then, it turns out that the eight barrels contain spray, photographic developing liquid and waste containing quicksilver.

"Ok, put the barrels here for the moment," Sven Lundgren says resignedly. "But with your next load you must have the original form."

"If We Refuse, the Waste Will be Emptied in the Woods"

"We say no most reluctantly, for we know from experience that the waste can then easily end up in the woods or in some ordinary dump," Sven Lundgren says. "Sometimes firms call here and ask how much it will cost to get rid of the waste, and when they hear the price, they slam down the receiver."

"It would be best if the municipality introduced scheduled collection routes in the industrial areas, just as is done with household waste," Sten-Olov Hellgren, a chemical engineer at Ragn-Sell, holds.

"I do not understand what the municipality is waiting for. In this manner we would get rid of the illegal dumping and the frightening prices for getting rid of the waste."

Ingemar Josefsson, municipal councilman for environmental matters, informs DAGENS NYHETER that the idea sounds interesting. In any case one should find out how the environmentally dangerous waste is picked up and delivered now.

The Board of Licenses has decided that Industrial Distillation AB in Lovsta shall be shut down at the turn of the year. If worse comes to worse, the infectious waste from the hospitals and the waste from the paint industry will have no place to go. The SAKAB [Swedish Waste Conversion Company AB] plant in Norrtorp has been delayed because of environmental protests. The plant will be ready at the earliest in 1982. If there is a no to Norrtorp, there will be a further 4-year delay until a plant will be ready.

SADAB has assumed the responsibility of taking care of all environmentally dangerous waste in Sweden. The municipality in Stockholm has a monopoly on the collection and transport. The problem is that SAKAB does not have the resources to take care of the waste. The worst waste, such as pesticides, quicksilver batteries, etc., are shipped abroad. Each year there is about 12,000 tons of environmentally dangerous waste in Stockholm.

Automobile service stations, car washes, the graphic arts industry, the finishing industry and other technically advanced refining are examples of the activity which produce much of the environmentally dangerous waste in Stockholm.

Some examples: 108 tons of cyanide-containing waste is created yearly in Stockholm; 304 tons of finishing waste mostly slim from finishing baths in industry; 576 tons of waste containing silver or zinc, mostly from photographic baths. The figures are not definitive, since they are based on voluntary information on forms.

The Nature Conservation Department hopes this year to obtain a better inventory by means of a more detailed examination branch by branch.

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WORLDWIDE SERIAL REPORTS

WORLDWIDE REPORT: Environmental Quality
WORLDWIDE REPORT: Epidemiology
WORLDWIDE REPORT: Law of the Sea
WORLDWIDE REPORT: Nuclear Development and Proliferation
WORLDWIDE REPORT: Telecommunications Policy, Research and Development

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